

BOOK REVIEWS

PLANT CELL AND TISSUE CULTURE: PRINCIPLES AND APPLICATIONS, edited by W. R. Sharp, P. O. Larsen, E. F. Paddock and V. Raghavan. Columbus, Ohio: Ohio State University Press. ISBN 0-8142-0287-X. List price US \$37.50

This book, the title of which differs only by transposition from that edited by the late H. E. Street (*Botanical Monographs*, Vol. II, 1973), is dedicated to the memory of this pioneer in the area of *in vitro* culture, and is based on a colloquium held at the Ohio State University in 1977. It is unfortunate that it took the editors two years to publish the proceedings since much of the information to hand at the time was novel and some of the ideas far-reaching.

The 37 contributions have been organized into four parts: (1) global status of food and agriculture, (2) physiology of growth and morphogenesis, (3) genetics and (4) agricultural applications. Of the 10 papers in the first part only two actually deal with *in vitro* culture; the others, one assumes, were probably intended to indicate the kinds of problems (food production) to which future TC research might be directed. Parts 2 and 3 contain little that has not been said before, and it is perhaps to be expected that with international TC symposia of one kind or another occurring with such regular frequency, that stalwarts such as Steward, Cocking, Gamborg, Butenko, and others will find it increasingly difficult to report "breakthroughs" on each occasion.

Part 4 is, in my opinion, the heart of this book since most of the 17 papers deal with issues of practical consequence, that is, the application of *in vitro* culture methods to agriculture, horticulture and forestry. Sommer's and Brown's contribution on the application of tissue culture to forest tree improvement is well-researched and their reference list is extensive and thorough. Tsai-Ying Cheng who, as one of the most imaginative and enthusiastic of workers has been a leader in the area of mass clonal micro-propagation for the last five or more years, gives a good account of the current status of *in vitro* techniques as they apply to *Pseudotsuga menziesii* (Douglas fir), a tree of great economic importance in the U.S.A. and fast becoming so in parts of Europe, for example, France.

In this regard one misses a contribution by M. Boulay of AFOCEL (France) who, perhaps more successfully than anyone else, has gone a long way in bridging the gap between the *in vitro* regeneration of some of the conifers and their commercial outplanting.

The book contains nearly 1 000 pages, is studded with specialist information and pertinent references and, on balance, is good value for money.

CHRIS H. BORNMAN

IN VITRO CULTURE OF HIGHER PLANTS: BIBLIOGRAPHY, by R. L. M. Pierik, with pp. 149. Distributed by Knipphorst Scientific Bookshop, Box 67, 6700 AB Wageningen, Netherlands. December, 1979. US \$27.00

Were it not for the indication "Bibliography" in small print on the attractively illustrated cover page, the title of this book could be misleading. Under the title *In Vitro Culture of Higher Plants* the author has mainly collected a list of surnames (in many cases only those of senior authors) and abbreviated journal citations pertaining to applied aspects (vegetative propagation) of plant tissue culture. About 70% of the volume of the book is made up of entries such as, for example: Arora and Singh. 1978. *Curr. Sci.* 47: 867-868. Similarly, genera and species from which haploids or from the embryos of which whole plants have been regenerated are also listed. Orchids merit a separate section of the book, as does mericulture in relation to freeing clonal material of pathogens. A section titled "Test-tube fertilization" has 21 entries, while the author rounds off his book by indulging briefly in some journal-listings statistics.

The information in the book is no doubt based on R. L. M. Pierik's own extensive offprint collection and as such is incomplete, although his own work is fully cited. To have any real value the entries should carry full citations and be organised more specifically in accordance with the many branches of the subject. Otherwise it cannot—and I sincerely trust it does not—replace the bibliography section of the *IAPTC* (International Association for Plant Tissue Culture) *Newsletter*, as the author in his rather naïve preface hopes it might. (The bibliography listed in the quarterly *IAPTC Newsletter* covers aspects of physiology, biochemistry, genetics, secondary products and cytodifferentiation and is reasonably up-to-date. References are fully cited and, in addition, the country in which the research was undertaken is also indicated.)

Pierik's book provides limited source material and at the price of US \$27.00 is also too expensive. One cannot avoid the feeling that a large part of the price is intended to defray the cost of the 18 colour pictures on the cover.

CHRIS H. BORNMAN

PROCEEDINGS OF THE THIRD NATIONAL WEEDS CONFERENCE OF SOUTH AFRICA, 1979, with pp. 214, 85 figures and tables. Obtainable from the publisher: A. A. Balkema, P.O. Box 3117, Cape Town. Hard cover R20,80.

These proceedings, edited by S. Naser and A. L. P. Cairns on behalf of the Southern African Weed Science Society, have appeared two and a half years after the proceedings of the Second National Weeds Conference. Like their predecessors these proceedings set out to be nothing more than a record of the papers presented on a variety of weed subjects but, in lieu of other readily available published material on weeds in the sub-continent, they will be elevated almost automatically to the status of a "national review" and will be prescribed reading for anyone interested in our weed problems.

Twenty-six of the forty-two papers read at the conference are reproduced in this volume. They include two highly topical reviews. The first provides a fascinating picture of the stages in the development of herbicides "from synthesis to reality", including the many hazards, the precautions that have to be taken and the considerable financial risks involved. It will be an eye-opener both to those who wonder why more and better herbicides are not more readily available, and to those who decry their use.

A second paper of note is that by a visitor from Zimbabwe on the role that minimum-tillage has to play in reducing agronomic weed problems, in conserving the energy (both chemical and mechanical) put into weed control, and in conserving the whole farming environment.

The chemical control papers are mainly concerned with the control of weeds in our staple cereal crops, and they deal in some detail with the respective merits of pre- and post-emergence application of herbicides, and the determination of the best growth stage of the crop for post-emergent applications.

Other chemical control aspects dealt with are: factors influencing the use of atrazine in maize (the most important single herbicide/crop relationship in South Africa at present) and the aerial application of herbicides to encroaching woody species (an important pasture and sensitive environmental problem).

There is encouraging news, from a representative of the Department of Forestry, on progress with the mechanical eradication of *Hakea* and there are several papers on forestry weeds and their control in general. Biological control is represented by descriptions of possible control agents for *Acacia longifolia* (Sydney golden wattle) and *Sesbania punicea*.

Other papers include reports on: woody plant invaders in the central Transvaal, Australian *Acacia* species in the S.W. Cape, Nassella tussock infestation on Devil's Peak, *Aristida junceiformis* (ngongoni), *Cyperus rotundus* (red nutgrass), *Opuntia ficus-indica* (prickly pear), and *Myriophyllum* (water milfoil or parrot's feather).

In the preface mention is also made of other important developments in weed control in

South Africa, e.g. the success story of the control of *Eichhornia crassipes* on Hartebeespoort Dam, and the provision of a National Weed List.

These proceedings cover a period when there has been strongly burgeoning interest in weeds and a growing realization of their impact on both production and conservation. They provide an invaluable record of the development of the science as well as providing information on particular problems and their solutions.

M. J. WELLS